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ABSTRACT

During the Spring semester of 1975, the University of Delaware initiated a PLATO project with the dual purpose of demonstrating how a computer system might function in a university and of evaluating what part such a system might play in the future of the university and its supporting community. The demonstration phase of the project, which included faculty training in PLATO programing, resulted in the generation of faculty enthusiasm which was sustained during the second phase when the decision was made to expand to eight terminals. This report describes the organization and history of the project, PLATO programs under development, and conclusions and directions for the future. (Author/STS)

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Results of the 1975 Delaware PLATO Project

by

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University of Delaware

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

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Results of the 1975 Delaware PLATO Project

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- Abstract -

During the Spring semester of 1975 the University of Delaware initiated a PLATO project with the dual purpose of demonstrating how a computer-based educational system may function in a university, and of evaluating what part such a system might play in the future of the university and its supporting community.

The first PLATO terminal was installed on March 14, 1975. A coordinating committee consisting of seventeen faculty members was formed representing all academic units of the university. Three student assistants were hired to arrange demonstrations and to assist faculty members in writing PLATO programs. A seven-week seminar was held in which the coordinating committee and the student assistants were introduced to TUTOR, the PLATO authoring language. By the end of May the PLATO users group had increased to include 51 faculty members, and proposals to use PLATO had been received from Agriculture, Art, Computer Science, Education, Home Economics, Music, Nursing, Physical Education, Sociology, and Continuing Education. The demonstration phase of the project showed that the PLATO system is capable of generating initial enthusiasm for computer-based education among faculty members in these academic areas.

During the summer of 1975 it was decided to expand the project to a level of eight PLATO terminals. A full-time PLATO programmer was hired; an instructional development consultant was assigned to the project; and the number of student assistants was increased from three to ten. During the Fall semester seminars were held in beginning PLATO programming, advanced PLATO programming, and PLATO lesson design. The number of faculty involved increased to a total of 98, and additional proposals to use PLATO were received from the departments of Physics and Theatre. The second phase of the project has shown that in addition to kindling initial interest, the PLATO system is capable of sustaining the level of motivation required for faculty members to follow through on their original proposals.

- Introduction -

Prior to 1975, computer-assisted instruction was practically non-existent at the University of Delaware. Administrative data processing and scientific research dominated the computing enrironment. The University of Delaware Computing Center (UDCC) did not support a CAI language; moreover, it was not until 1970 that the university

installed its first time-sharing machine. Only two instructional systems were being developed on the time-sharing machine, namely, a computer-assisted testing system[1] in the College of Education, and a drill-and-practice ear-training system[2] in the College of Arts and Science. Very few faculty members had a knowledge of computer applications to instruction. Instructional use of the computer was minimal for a university with an enrollment of 20,000 students.

During the Fall of 1974, the university's computer applications to education committee planned a series of seminars and demonstrations for the purpose of making available to the Delaware faculty information on how a computer-based educational system may function in a university, and of evaluating what part such a system might play in the future of the university and its supporting community. A major portion of the committee's planning consisted of the review and selection of a computer-based educational system which could support the demonstration. The criteria used in making the selection consisted of the following list of system requirements:

1) An overall system design which can support many instructional strategies such as gaming, simulations, testing, drill-and-practice, and self-paced programmed instruction.

2) An existing library of demonstration programs encompassing many academic areas.

3) A programming language which is both easy for faculty members to learn, and at the same time powerful enough to support instructional computing.

4) A student record-keeping capability to support educational research in learning behaviors.

5) High-speed interactive graphics for both textual and pictorial displays.

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1 David P. Yens and Victor R. Martuza, "Interactive, Repeatable Testing; A Many-Faceted Tool," Proceedings of the Thirteenth Annual Convention of the Association for Educational Data Systems.

2 Fred T. Hofstetter, "GUIDO: An Interactive Computer-Based System for Improvement of Instruction and Research in Ear-Training," Journal of Computer-Based Instruction (May, 1975), pp. 100-106.

6) A very good overall system reliability.

Systems reviewed included the Dartmouth Time-Sharing System (DTSS), COURSEWRITER, TICCIT, PLATO, and DELTA (a system working in Delaware's secondary schools with a PDP-11 through the support of the Delaware School Auxiliary Association). Based on the criteria listed above, the PLATO system was the unanimous choice for the University of Delaware's demonstration which began during the Spring semester of 1975. The remainder of this article describes 1) the organization and history of the 1975 Delaware PLATO project, 2) courseware development in progress at the university, 3) conclusions and directions for future study, and 4) a directory of faculty and staff who are involved in the project.

- Organization and History of the 1975 Delaware PLATO Project -

The 1975 Delaware PLATO project contained three main phases which occurred during the Spring, Summer, and Fall semesters. The first phase consisted of demonstrations of the PLATO system for each academic unit of the university, a seven-week seminar in TUTOR (the PLATO authoring language) for faculty members interested in developing their own courseware, and the solicitation of proposals from each college concerning the implementation of existing courseware and/or the development of new PLATO programs. A committee consisting of seventeen faculty members coordinated all of these activities with the support of the Computing Center and the Instructional Resources Center. The Computing Center provided necessary assistance in the design of advanced data structures. The Instructional Resources Center provided consultation in the proper use of computers in education and assisted faculty members in the review and evaluation of PLATO within their respective areas. No released time nor compensation of any other kind was given to faculty members as an incentive to work in this project. The only staff members who worked on the first phase of the project as part of their normal university assignments were one systems programmer (50%), two instructional development consultants (25%), and three student assistants.

The first PLATO terminal was installed on March 14, 1975 in the university's Amy E. du Pont Music Building. Formal demonstrations were held for faculty members in agricultural sciences, art, business and economics, computer science, continuing education, education, engineering, home economics, music, nursing, physical education, and sociology. Faculty members in other areas were given the opportunity of seeing PLATO on an individual basis by contacting their area coordinators or the PLATO site director. By the end of May, fifty-one faculty members joined together in making a proposal to develop, evaluate, and implement computer-based instructional programs in ten departments. During the summer of 1975 the university decided to expand the PLATO project to a level of eight terminals in order to determine whether these faculty members would continue the high level of involvement and commitment needed to accomplish the developmental goals of their proposals. A PLATO support staff was formed consisting of a programming group and an instructional development group. The programming group consists of a professional applications programmer/analyst who teaches seminars in PLATO programming and assists faculty members with difficult programming problems, and eight student programmers who work with faculty members in the writing of PLATO lessons. The instructional development group consists of three professional instructional development consultants and two student assistants from the Instructional Resources Center. Two of the professional consultants serve on a part-time basis; the third is primarily assigned to the PLATO project as coordinator of lesson design and evaluation.

During the Fall of 1975 the PLATO project continued to expand both within departments which had already made formal proposals as well as in new academic areas. The number of faculty involved increased from fifty-one to ninety-eight, and the number of departments involved increased from ten to fourteen. It is significant that none of the faculty members involved in the original proposal have lost interest in the PLATO project; rather, all of them are continuing to develop instructional programs according to their original proposals. The only problem which the project has encountered is the usual delay in procurement and installation of computing equipment. During the Fall of 1975 only two terminals were in operation; the full complement of

eight terminals will not be operational until Spring of 1976.

- PLATO Programs Under Development at the University of Delaware -

PLATO programs are being developed in nine academic areas of the university. In addition, PLATO proposals are being considered in four other departments. These programs are described as follows.

1. Agriculture. The College of Agriculture has shown a strong interest in PLATO as a teaching tool in plant science, animal science, agricultural engineering, and entomology. Existing Illinois courseware in genetics and veterinary science is being implemented in order to reduce the need for laborious, time-consuming field observations, thereby increasing instructional productivity. In addition, Delaware faculty members are developing taxonomic programs in botany, zoology, and entomology.

2. Art. The Art Department is developing programs in production techniques, package design, and advertising in order to allow students to work interactively with layout possibilities in magazines, newspapers, brochures, and editorials where students need to be able to visually identify type faces and recognize their psychophysical effects. PLATO will help art students gain a greater conceptual knowledge of design principles by giving them an opportunity to do hundreds of lettering experiments instead of the three experiments to which they are presently limited by restrictions in the amount of faculty time available to grade the experiments. Especially useful in the art programs is PLATO's ability to display microfiche images of items such as magazine advertisements, symbols for corporate identity, and illustrations of principles of design (e.g., form, line, light, movement, balance, and rhythm).

3. Education. All four departments in the College of Education have become involved in the PLATO project. The Department of Curriculum and Instruction is investigating PLATO's usefulness in teaching pre-college reading and mathematics. A program entitled "Basic Skills in Scientific Inquiry" is being developed in order to individualize and improve the preparation of elementary education majors and in-service teachers. The Department of Educational Foundations plans to use

PLATO in its graduate course in educational measurements to help students master the geometric properites of statistics. Specific topics to be programmed include manipulation of the multitrait-multimethod matrix, and geometric properites of standard errors of the mean, correlation, linear regression, and differences between means of distributions with different variances. Educational Foundations also plans to transfer its computer-assisted testing system to PLATO. The Department of Occupational Education is developing a PLATO career education package based on the Ohio State career education modules and additional modules written by Delaware faculty members. The Department of Professional Services is developing programs for audiovisual equipment training.

4. Home Economics. PLATO programs are being developed for use in three courses in the textiles and clothing area of the College of Home Economics. In the basic and advanced courses in clothing process, PLATO will assist in the presentation of principles and demonstration of techniques for the analysis and correction of garment-fitting problems. Students in flat pattern design will use PLATO to analyze designs and interpret patterns. In addition to greatly improving instruction in textiles and clothing courses, PLATO will reduce the consumption of laboratory supplies and increase instructional productivity. The College is also organizing a national consortium for the development, evaluation, and distribution of computer-based educational materials in home economics.

5. Music. The Music Department has already developed a computer-based ear-training system called GUIDO at the University of Delaware Computing Center. By using this system students learn how to master the complexities of music reading so that they can effectively recognize and correct errors in musical performance. Quantitative evaluation of the GUIDO system has shown that students who use GUIDO score an average of one letter grade higher than students using traditional methods of ear-training. The GUIDO system is being implemented in PLATO in order to take advantage of PLATO's speed and advanced graphics capabilities. A very important benefit to the music department is PLATO's communications network that permits on-line communications with other universities that have PLATO terminals. A national consortium for computer-based musical instruction has been formed by means of this communications link.

6. Nursing. The College of Nursing has evaluated existing health science and nursing programs on the Illinois PLATO system, and has proposed that these programs be implemented at the University of Delaware. In addition, the College is preparing original lessons in clinical simulation and is modifying diagnostic lessons in the Illinois veterinary medicine package for use on humans.

7. Physical Education. The university's professional preparation program in Physical Education requires that all students complete a series of skill-technique and methods courses. Because of time limits, most of the classes must be devoted to psychomotor development. The Division of Physical Education is developing a package of PLATO programs which will allow a greater emphasis on the understanding of cognitive concepts through individualized instruction that can be done outside of the classroom.

8. Physics. The Physics Department is conducting a controlled evaluation of the usefulness of PLATO to assist students in calculus-based introductory physics. Included in this experiment are programs from the existing Illinois physics library as well as new programs dealing with specific problems assigned in the Delaware physics courses.

9. Theatre. The Theatre Department is developing an interactive time-line program to be used in teaching theatre history. By using this program students will be able to explore theatre history on an experiential basis under the guidance of a computer-managed instruction module which will insure that they achieve the necessary informational competencies.

10. Other PLATO Activities. Three departments have made PLATO proposals which have not been initiated due to the lack of sufficient terminal time. Continuing Education has made an ambitious proposal to place PLATO terminals in its off-campus learning centers in Wilmington, Dover, Georgetown, and Aberdeen. By providing greater flexibility in scheduling, decentralized learning stations, and self-paced instruction PLATO is providing a very significant learning alternative for the growing population of part-time students. The Sociology Department has proposed that PLATO be made available to its students as a multi-purpose computing resource to be used on a voluntary basis by students who need to review basic materials or who wish to acquire supplementary information. Sociology students will make heavy use of existing Illinois statistical courseware,

as well as the statistical programs being developed by the College of Education. The computer science department has requested the use of PLATO in its graduate course in computer graphics. Evaluations of the PLATO system are also in progress in the departments of languages and English. And in preparation for introducing PLATO in the elementary schools, favorable reactions have been received as a result of demonstrations held for four groups of elementary school students and their parents.

- Conclusions and Directions for the Future -

At the beginning of the Delaware PLATO project only two departments were involved in the implementation of computer-based instructional systems at the University of Delaware. Only a few faculty members knew about the PLATO system, and no one was proficient in PLATO programming. Now, less than a year after the installation of the first PLATO terminal on the Delaware campus, ninety-eight faculty members have learned enough about the PLATO system to propose and begin implementation of computer-based educational programs in nine academic areas of the university. Conclusions to be drawn from this rapid growth of interest in the PLATO system include the following:

1) The existing library of demonstration programs in the Illinois PLATO system provides a good example of what can be done with a computer in education.

2) The PLATO programming language is designed in such a way that faculty members who do not have a background in computer science are able to learn it well enough to either write PLATO lessons themselves or to direct student programmers in the implementation of lesson designs.

3) The computing power and input/output features of the PLATO system are sufficient to support applications as diverse as those described in the discussion of courseware development (above, pp. 5-7).

4) The administration of the Delaware PLATO project by a faculty committee with the technical support of the university's computing center, instructional resources center, and student programmers is a viable model for the introduction of a computer-based instructional system at a university.

5) The PLATO system is capable of sustaining the motivation of faculty members who have received no released time nor incentives of any kind other than the improvement of instruction at the University of Delaware.

The evaluation of the PLATO system at the U.S. Army Ordnance Center and School at the Aberdeen Proving Ground concluded that: "In looking at the total picture, the PLATO IV System is completely viable, acceptable, and desirable as a training medium in all aspects except its cost as a delivery system."[3] Through their support of PLATO the National Science Foundation and the State of Illinois have demonstrated that the technological and human engineering problems attendant to the development of computer-based educational systems can be solved. The future of PLATO now depends on industry's ability to lower its cost.

- Directory of Faculty[4] and Staff Involved in the Delaware PLATO Project -

Project Leaders

Agriculture	George F. W. Haenlein
Art	Ray Nichols
Computer Science	David E. Lamb
Continuing Education	Richard B. Fischer
Education	Robert L. Uffelman
Elementary Schools	William Lewis
English	Dennis R. Schaffer
Home Economics	Frances K. Smith
Music	Fred T. Hofstetter
Nursing	Shirley Cudney
Physical Education	David A. Barlow
Physics	Cheng-Ming Fou
Sociology	Kenneth W. Eckhardt
Theatre	Brian K. Hansen

3 Final Report: Evaluation of the PLATO System in a Military Training Environment, 2 Vols. (Aberdeen Proving Ground: U.S. Army Ordnance Center and School, 1975), I, ix.

4 Only those faculty who are project leaders are listed in this directory. For information regarding other faculty members involved in the PLATO project, contact the appropriate project leaders.

PLATO Support Staff

James H. Wilson, Group Director for Programming
William A. Mahler, Group Director for Lesson Design
Robert K. Shaffer, Project Leader, University of Delaware Computing Center
Dennis R. Schaffer, Instructional Development Consultant
Dennis R. Williams, Instructional Development Consultant
Charles Wickham, Assistant Project Leader in Education
Beverly Pfrogner, Graduate Assistant for Lesson Design
Larry Laravela, Systems Programmer, University of Delaware Computing Center
Abdul Nisar, Consultant for Lesson Design in Nursing
Yvonne Shafer, Consultant for Lesson Design in Theatre

Student Programmers

Agriculture	Craig Lewis
Art	Joseph Maia
Education	Ed Boas
Home Economics	Dorothy Elias
Languages	Dan Williams
Music	Bill Lynch
Nursing	James Trueblood
Physical Education	David Cummings

Administration

L. Leon Campbell, Provost and Vice-President for Academic Affairs
John J. Falcone, Director of the University of Delaware Computing Center
Donald E. Nelson, Director of the Instructional Resources Center
Fred T. Hofstetter, Assistant Professor of Music and Director of the Delaware PLATO Project